

REMARKS/ARGUMENTS

The action by the Examiner of this application, together with the cited references, has been given careful consideration. Following such consideration, claims 1, 12-13, 22, 24, 45, and 59 have been amended to define more clearly the patentable invention applicant believes is disclosed herein. Moreover, claims 11, 23, and 58 have been cancelled. Claims 8-9, 20-21, 25-44, and 55-57 were previously cancelled. Claims 2-7, 10, 14-19, 46-54, and 60 are unchanged by the present amendment paper. It is respectfully requested that the Examiner reconsider the claims in their present form, together with the following comments, and allow the application.

The Examiner has rejected claims 1, 10-13, 22-24, 45-47, and 58-59 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,608,156 to Ando et al. Furthermore, the Examiner has rejected claims 2-5, 14-17, 48-52, and 60 as being obvious in view of the combined teachings of Ando et al. and U.S. Patent No. 5,352,574 to Guiseppi-Elie. The Examiner has also rejected claims 6-7, 18-19, and 53-54 as being obvious in view of Ando et al., Guiseppi-Elie, and U.S. Patent No. 5,651,922 to Nahass. It is respectfully submitted that none of the cited references, taken individually or in combination, teaches or suggests the applicant's invention as set forth in the present claims.

With respect to independent claim 1, this claim now recites "memory means for storing a plurality of predetermined *slope values* indicative of changes in said electrical property as a function of time exposure of the electroactive material to vaporized hydrogen peroxide at known concentrations; and means for determining a concentration of the vaporized hydrogen peroxide corresponding to the measured value using the plurality of predetermined *slope values* stored in said memory means."

Independent claim 13 now defines a method for sensing a concentration of vaporized hydrogen peroxide that includes the steps of "storing in memory a plurality of predetermined *slope values* indicative of changes in said electrical property as a function of time exposure of the electroactive material to vaporized hydrogen peroxide at known concentrations; and determining a concentration of the vaporized hydrogen peroxide corresponding to the measured value using the plurality of predetermined *slope values* stored in said memory."

Independent claim 45 now defines a method for sensing a concentration of a chemical component in a chamber that includes the steps of “storing in memory a plurality of predetermined *slope values* indicative of changes in said electrical property as a function of time exposure of the electroactive material to the chemical component at known concentrations; and determining a concentration of the chemical component corresponding to the measured value using the plurality of predetermined *slope values* stored in said memory.”

It is respectfully submitted that none of the cited references teaches or suggests the use of *slope values* that are indicative of changes in an electrical property of an electroactive material as a function of time exposure of the electroactive material to known concentrations of a chemical component (such as vaporized hydrogen peroxide in the case of claims 1 and 13). It is further submitted that, none of the cited references, taken individually or in combination, teaches or suggest determination of a concentration of a chemical component (such as vaporized hydrogen peroxide in the case of claims 1 and 13) corresponding to a measured value using the plurality of predetermined *slope values* stored in memory.

Ando et al. discloses a method and apparatus for detecting the concentration of hydrogen peroxide vapor in a treatment vessel by use of a semiconductor gas sensor 8. Semiconductor gas sensor 8 includes an oxide semiconductor sensor element made of a metal oxide sintered product whose conductivity changes in contact with hydrogen peroxide vapor, and a means for heating the electrode embedded in the sensor element. Free electrons in the vicinity of the surface migrate to change the conductivity of the sensor element where such electrons are released by the absorption of gas components to the surface of oxide particles (such as n-type semiconductor oxides and p-type semiconductor oxides) that constitute the sensor element.

In operation of semiconductor gas sensor 8, hydrogen peroxide vapor in a treatment chamber is chemically absorbed by the oxide semiconductor sensor element, depending upon the concentration. As a result, free electrons migrate in the oxide semiconductor sensor element to increase the conductivity of the oxide semiconductor element. The decrease in the resistance value due to the increase in the conductivity is converted to an increase in voltage in an electric circuit that is input to a concentration indicator 11.

The increase of conductivity (i.e., decrease in resistance) due to exposure of the sensor element to hydrogen peroxide vapor is converted into an increase of the output voltage of

the semiconductor gas sensor 8. Concentration indicator 11 receives an output voltage signal from semiconductor gas sensor 8, and converts the output voltage to an indication of the concentration of the hydrogen peroxide vapor. See column 5, lines 36 *et. seq.* and column 6, lines 1-2.

It appears that the term "conversion rate," as used in the specification, refers to the rate at which the output voltage of semiconductor gas sensor 8 is converted to a value indicative of the concentration of hydrogen peroxide vapor. This interpretation is further supported by the statement in Ando et al. (column 6, lines 28-37):

"As is obvious from FIG. 2, the sensor output and the concentration of the hydrogen peroxide vapor have a certain relation, and the conversion rate from the sensor output to the concentration of the hydrogen peroxide vapor can be easily obtained. Therefore the conversion rate as obtained is fixed. At this conversion rate, the output of the semiconductor gas sensor 8 is converted and indicated as a concentration of the hydrogen peroxide vapor 4a in the treatment vessel 2 by the concentration indicator 11."

The Examiner has made reference to several figures in Ando et al. in support of the rejection of the applicant's claims. These figures will now be addressed.

FIG. 2 shows a *linear* relationship between the sensor output voltage and the concentration of hydrogen peroxide vapor. In this figure, slope values do not provide an indication of hydrogen peroxide vapor concentration.

FIG. 5 illustrates a relationship between the sensor output voltage and the concentration of hydrogen peroxide vapor at varying pressures (see also column 9, lines 52-57). Again, slope values do not provide an indication of hydrogen peroxide vapor concentrations.

FIG. 3 illustrates that the sensor output responds quickly to the concentration of hydrogen peroxide vapor and the change thereof. However, the change in the sensor output voltage as a function of time is not used by Ando et al. as a means for determining the concentration of vaporized hydrogen peroxide. Instead, the sensor output voltage is used directly to determine the concentration of the hydrogen peroxide vapor. As stated above, slope values are not used to determine concentration of the vaporized hydrogen peroxide.

FIG. 6 illustrates a situation where a contact gas is converted from clean air (i.e., the concentration of the hydrogen peroxide vapor is 0 mg) to a hydrogen peroxide vapor having a concentration of 1.4 mg. It is shown that more than 10 minutes elapses before the sensor provides an output corresponding to the concentration of hydrogen peroxide vapor. Thus, FIG. 6 illustrates the poor response time provided by an HF sensor used in the controlled potential electrolysis method (see column 7, line 47 *et. seq.*). As indicated above, slope values are not used to determine the concentration of the vaporized hydrogen peroxide.

Furthermore, the Examiner has argued that “Ando et al. teaches that the predetermined correction data incorporates the use of a predetermined conversion rate, which is inherently anticipated to be a slope value.... A slope value for a linear calibration line is mathematically a rate (see FIGS. 2 and 6).” It is respectfully submitted that Ando et al. fails to teach or suggest using the *rate of change* in the detected sensor output voltage as a means for determining the concentration of the hydrogen peroxide vapor. Instead, Ando et al. teaches a direct relationship between the sensor output voltage and the hydrogen peroxide vapor concentration.

In the applicant’s claimed invention, it is the slope values (indicative of changes in the electrical property as a function of time exposure of the electroactive material to a chemical component) that provides an indication of the concentration of the chemical component. It is not the value of the electrical property itself that is used to determine concentration.

Furthermore, it is respectfully submitted that none of the other cited references, taken individually or in combination, provide for the deficiencies of Ando et al. discussed above. Accordingly, it is respectfully submitted that claims 1, 13, and 45 are patentable over the cited references.

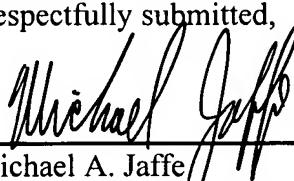
The remaining claims depend from independent claims 1, 13, or 45. Accordingly, it is respectfully submitted that these dependent claims are likewise patentable over the cited references for at least the reasons set forth above in connection with the independent claims.

In view of the foregoing, it is respectfully submitted that the present application is now in proper condition for allowance. If the Examiner believes there are any further matters

that need to be discussed in order to expedite the prosecution of the present application, the Examiner is invited to contact the undersigned.

If there are any fees necessitated by the foregoing communication, please charge such fees to our Deposit Account No. 50-0537, referencing our Docket No. ST8010US.

Respectfully submitted,



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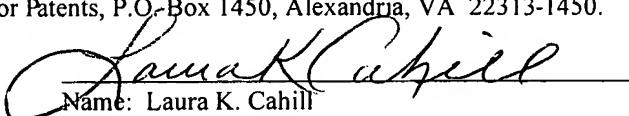
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